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Spatial distribution of CD44 and hyaluronan in the proximal tibia of the growing rat.

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CD44 has been described as a cell surface hyaluronan receptor present on a variety of different cells, and it is generally assumed to be prevalent in most connective tissues that contain hyaluronan. A major aim of this study was to test that presumption by localizing CD44 and hyaluronan within several tissues of the proximal tibia of the growing rat. Comparison of these profiles would reveal whether CD44 and hyaluronan co-localize with high fidelity, as would be expected if CD44 were a major hyaluronan binding protein. Using in situ hybridization and immunohistochemistry, CD44 was identified on osteoclasts, chondroclasts, osteocytes, hematopoietic marrow cells, synovial cells, and connective tissue fibroblasts (ligaments, tendons, and fascia). Although the majority of osteocytes expressed CD44, reduced expression was observed for osteoblasts and osteoprogenitor cells. Additionally, CD44 was not detected on chondrocytes from epiphyseal and metaphyseal growth cartilages or in meniscal fibrocartilage. Using biotinylated G1 domain from aggrecan and link protein, hyaluronan was observed in the maturational and hypertrophic zones of all growth cartilages, the synovium and other fibroblastic connective tissues, regional areas of the periosteum and endosteum (around osteoblasts, osteoprogenitor cells, and osteoclasts), osteocyte lacunae, and surrounding blood vessels. In regions of co-localization for CD44 and hyaluronan, it seems that CD44 is a likely hyaluronan binding protein in several tissues of the proximal tibia. However, it does not appear to be the predominant hyaluronan binding protein in growing cartilages of the weanling rat.

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